CONTRIBUTIONS TO WESTERN BOTANY VI.

BY MARCUS E. JONES.

I. THE NAVAJO BASIN.

I propose this name for that region, both botanically and zoologically interesting, which occupies Southeastern Utah, Southwestern Colorado, Northwestern New Mexico, and Northeastern Arizona, whose limits are fairly well defined by the Colorado River and its tributaries north of the entrance of the Grand Cañon (the junction of the Little Colorado and the Colorado) as far as the Book Cliffs on the north with a northern and narrow extension along the Green River at least as far as the base of the Uinta Mountains. Its western boundary is the base of the Coal Range (Wasatch Plateau of Powell) in Utah, the Henry Mountains, and the Buckskin Mountains on the southwest. Its eastern boundary is the high country east of Grand Junction, Colorado, extending thence east of south past the base of Mt. Sneffles and thence along the edge of the mesa country through Southern Colorado and south as far as Coolidge, New Mexico, thence following the base of the northern slope of the Mogollons and including the valley of the Little Colorado to the base of the San Francisco swell near Cañon Diablo and thence north to the Colorado River. This large and isolated region belongs almost wholly to the Upper Sonoran of Merriam, and is to be considered as a subdivision of that region with a fringe of the Transition group on its edges. It has been isolated since the Miocene Tertiary, or at least since the Pliocene with its present drainage, and has been surrounded on all sides by lofty and cold mountain barriers from 7000 to 10,000 feet in average height above the sea with the exception of a very narrow stretch of country only a few miles wide and about 5000 feet above the sea from Johnson, Ariz., and Kanab, Utah, to the Colorado River, which connects with the narrow belts along the rivers belonging to the Upper Sonoran. This narrow plateau belt below Kanab has very few plants that might be classed as Upper Sonoran, but is the lowest possible ingress to the basin except the precarious one along the dark gorge of the river itself where there is very little

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vegetation as whole, and no possible means of distribution of seeds except that of the wind and birds, the former quite strong and the latter very scarce. The elevation of the region is at its lowest along the river at or near Lee's Ferry, about 3000 feet above the sea, and is warm enough for figs, almonds, and possibly oranges; the upper end is at Green River, Utah (not Wyo), and Grand Junction, Colorado, a little over 4000 feet above the sea, and a most admirable place for grapes, peaches, etc. The rainfall will not average over ten inches and for the most part will not exceed six inches. The soil is a tenacious and very barren clay for the most part, though it is gravelly and sandy on the mesas bordering the region. The species of plants found peculiar to it so far are about sixty, possibly not so many; the species of mammals and reptiles, etc., so far found are about a dozen. There are a number of new insects, but I do not know just how many. The number of species that are identical with the Upper Sonoran of S. Utah and N. Arizona is not very great, but the general character of the life is Sonoran. The climate is very hot and dry; water is scarce except on the rivers which simply pass through the region. The region is almost uninhabited and never can support much life; game is scarce, and it is a veritable desert. The country is simply a great trough with branches, and is bordered with lofty cliffs of crumbling sandstones of Triassic age which make it a very difficult thing to traverse it except by long detours. At some other time I will try to give a list of the flora and fauna of the region, and show its relation to the surrounding ones.

II. SOME NEW SPECIES.

PHLOX ALBOMARGINATA n. sp. Allied to *P. cæspitosa*, densely matted flowering stems mostly simple, 1 to 3 inches high or none, erect or ascending, 1 to 3 flowered, usually 1-flowered; leaves 2 to 3 lines long, 1 to 1½ wide, rigid, spreading, acerose, ovate to lanceolate, usually the latter; general appearance light green, mid-rib narrow and not prominent, margins cartilaginous, thick, white, glabrous except the coarsely hispid ciliate base, inner surface (that inside the cartilaginous edge) dark green, rather loosely pubescent, with short, coarse, white hairs on both sides; internodes longer than the leaves, angular, white

pubescent, with the same kind of hairs; the leaves are in pairs, with fascicles of smaller ones in the axils; upper part of stems, peduncles, leaves, and calyx very glandular as well as pubescent with coarse hairs; pedicels stout, 2 to 4 lines long; calyx narrow, 4 lines long, tube with teeth 2½ lines long, the former 5-nerved prominently and the nerves with narrow green margins; calyx lobes very narrowly subulate, acerose, 1 to 1½ lines long, not spreading much; corolla purple or lighter, purple spotted at the throat, tube ½ a line wide at base and a line wide at apex, 1 to 2 lines longer than the calyx and teeth, lobes oval, entire, 2 lines long; flower 5 lines wide; stamens very unequally inserted, small, oblong, yellow; capsule 1½ lines long, exactly oval, obtuse, apiculate with the sharp vestige of the long (4 lines) style, the point of insertion of the capsule is very weak, and the capsule readily breaks away and falls off leaving an empty calyx; lobes of the style about ⅓ a line long; placental axis is triquetrous, with one large oblong seed attached by its inner face in each cell above the middle of the concave placental wall.

This unique Phlox in its foliage resembles *Galium Mathewsii* or *stellatum*. The glandular pubescence at once separates it from any other of its class. Sometimes the stems are absent and the single flowers arise from a rosette of very short (1 to 1½ a line) leaves, on pedicels 4 lines long and with a calyx only 2 to 3 lines long; corolla not reduced. This form I call var. *minor*.

East face of Mt. Helena, Montana, May, 1891. Rev. F. D. Kelsey.

ASTRAGALUS EASTWOODÆ Jones. *A. Preussii* var. *sulcatus* Jones "Zoe" iv, 37; as *A. Sulcatus* is preoccupied.

ASTRAGALUS HAYDENIANUS Gray. This rather pretty and very odoriferous plant is of late receiving fully as many synonyms as *A. lentiginosus*. In fact, every time it has been collected but twice it has received a new name. As I have shown in "Zoe" ii, 241, there is nothing to separate it from *A. bisulcatus* except its more slender habit and white flowers. For convenience I there separated two western forms of it as var. *major* (from Johnson, S. Utah) and var. *Nevadensis* (from Palisade, Nevada). Lately Mr. Greene visits my type locality and probably the very field

where I gathered the latter variety and describes it as *A. demissus*, then Mr. Sheldon, by the aid of the Index Kewensis, gives Mr. Greene's species a new name, *A. Jepsoni*, and my first var. another, *A. scobinatulus*. An examination of Mr. Greene's description shows that his specimens, though from the type locality of the var. *Nevadensis*, are pubescent and have unequal calyx teeth. As it is the fashion now to name everything in sight, I would suggest that the var. *Nevadensis* is fully as distinct as any of the other forms, and as the name is preoccupied (Index Kewensis) it is waiting for a brand new name and will be the property of the first man who gets into print.

Sometime botanists, when they get into the field, will learn that pubescence and comparative length of calyx teeth are slim foundations on which to hang species, in *Astragalus*.

ASTRAGALUS ARTEMISIARUM. *Astragalus Beckwithii* var. *purpureus* Jones "Zoe" iii, 288. Recent studies in the field make it reasonably certain that this is distinct from *A. Beckwithii*. The chief distinguishing characters are the purple flowers, rather cartilaginous pods with the interior filled with a watery juice and stipe with a fully formed joint near the middle. *A. Beckwithii* has ochroleucous flowers a dry and rather thin pod without watery juice and a joint in the stipe which is often reduced to a dark spot in the stipe which does or does not break at that point and generally irregularly.

THE DATES OF BOTANY BEECHEY, FLORA BOREALI-AMERICANA, AND TORREY & GRAY'S FLORA.

"FLORA BOREALI-AMERICANA W. Hooker.

This work came out in parts, but as was usual at that time no official statement was published as to the dates of publication. Consequent upon this, doubts as to the actual publication of many species therein contained have been rife. The following details may help to settle those questions:

Vol. i Part 1, consisting of six sheets, pp. 1-48, came out in 1829 (cf. Linnæa, v, 1830, Litt. 102); and Seringe, *Bull. Bot.*, i (mars, 1830), 49.

Parts 2 et 3, p. 49–144 in 1830 (cf. Linnæa, vi (1831), Litt. 154).

Parts 4 to 6, end of vol. i in 1834 (cf. *Ann. sc. nat.* Ser. II, tome iii (1835), 109, "Livr. 3–7."

Vol. ii, Part 7 in 1834. See last note.

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